

Withdrawn 2/1/05

**Program Revision – Chemistry Pre-Medical Minor**

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:
		Senate Action Date:	04-16

**Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee**

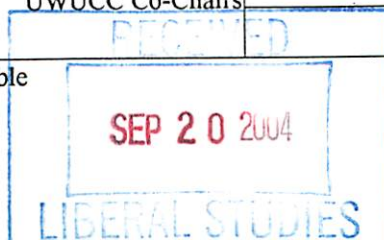
Contact Person: <b>Ronald F. See</b>	Email Address: <b>rfsee@iup.edu</b>
Proposing Department/Unit: <b>Chemistry</b>	Phone: <b>7-4489</b>

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

<b>1. Course Proposals (check all that apply)</b> <input type="checkbox"/> New Course <input type="checkbox"/> Course Prefix Change <input type="checkbox"/> Course Deletion <input type="checkbox"/> Course Revision <input type="checkbox"/> Course Number and/or Title Change <input type="checkbox"/> Catalog Description Change		
<u>Current Course prefix, number and full title</u>	<u>Proposed course prefix, number and full title, if changing</u>	
<b>2. Additional Course Designations: check if appropriate</b> <input type="checkbox"/> This course is also proposed as a Liberal Studies Course. <input type="checkbox"/> Other: (e.g., Women's Studies, Pan-African) <input type="checkbox"/> This course is also proposed as an Honors College Course.		
<b>3. Program Proposals</b> <input type="checkbox"/> New Degree Program <input checked="" type="checkbox"/> Catalog Description Change <input type="checkbox"/> Program Revision <input checked="" type="checkbox"/> New Minor Program <input type="checkbox"/> Program Title Change <input type="checkbox"/> Other <input type="checkbox"/> New Track		
<u>Current program name</u>	<u>Proposed program name, if changing</u>	
<b>4. Approvals</b>		
Dept Curriculum Committee Chair	<i>Wendy Lou Elcesser</i>	2/20/04
Department Chair	<i>Quentin J. Jussen Ramsey</i>	2/20/04
Coll. Curriculum Committee Chair	<i>[Signature]</i>	05/18/04
College Dean	<i>John D. [Signature]</i>	9/20/04
Director of Liberal Studies *		
Director of Honors College *		
Provost *		
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs		

\* where applicable

20 February 2004



**Program Revision – Chemistry Pre-Medical Minor**  
**Part II. Description of Curriculum Change**

1. Catalog Description for the Proposed Minor

**Minor (1) – Chemistry Pre-Medical**

<b>Required Courses:</b>		<b>18-20</b>
BIOL 111	Principles of Biology I	4cr
BIOL 151	Human Physiology	4cr
BIOL 263	Genetics	3cr
BIOL 331	Animal Developmental Biology	3cr
Choice of either CHEM 351 (4cr) or BIOC 301 and 302 (6cr)		4-6cr

1. Open only to Chemistry majors.

**2. Rationale for Changes.**

The change to 120 credit hours limits the ability of students to take a meaningful pre-medical preparation program as a concentration inside the B.S. Chemistry degree program. A student completing both the Chemistry B.S. degree and the former Chemistry Pre-Medical concentration could complete the program in 120 credit hours, but only if they are prepared to take MATH 123 and an intermediate-level foreign language without preparatory courses. As a part of our curriculum revision during spring 2003, the UWUCC suggested that the Chemistry Department package the pre-medical courses as a minor, rather than a concentration inside the B.S. degree. After consultation with faculty in the biology department, we have determined that the key courses to prepare the pre-medical B.S. chemistry majors for the MCAT and medical school are BIOL 111, 151, 263, 331 and a biochemistry experience (either CHEM 351 or BIOC 301&302). This minor would only be open to Chemistry B.S. and B.A. students, since it assumes the pre-medical student has the Chemistry, Physics and Math courses required in the Chemistry degree programs. As can be seen in Appendix D, the suggested sequence of these courses is designed to prepare the student to take the MCAT in the spring of their junior year. The footnotes in the current B.S. and B.A. programs are changed to reflect the requirements for the pre-medical minor

**Part III. Implementation**

**1. How the Proposed Revisions will affect Faculty Teaching Loads.**

All of the courses in the proposed minor are currently being offered, and the very small number of students projected to pursue this program (1-3 per year) will not have any significant impact on the class sizes of these courses.

**2. Adequacy of Other Resources.**

This proposed minor will have no significant impact on other resources.

**3. Expectation of an Increase or Decrease in the Number of Students as a Result of These Revisions.**

We expect no change in enrollment as a result of these changes.

## **Program Revision – Chemistry Pre-Medical Minor**

### **4. Intended implementation date – Fall 2005**

#### **Part IV. Periodic Assessment**

There are two components proposed for the periodic assessment of this degree program. One is a survey of the senior students completing the degree program, and the other is a five-year re-evaluation of the program by the departmental curriculum committee.

*Senior Survey* – A requirement in the revised CHEM 498 will be the completion of a survey (Appendix E) by the seniors in the B.S. degree program. The chemistry department secretary will transcribe the results of these surveys, and then the anonymous results will be distributed to the chemistry department faculty.

*Five-year Review* – The American Chemical Society evaluates the B.S. degree programs for certification every five years. It is proposed that the chemistry department curriculum committee will conduct a formal review of the curriculum two years before this scheduled review. Among the items that the committee should review are: a) the responses from the senior surveys; b) changes in ACS certification requirements; c) comments from colleagues about any potential changes in the degree programs. The ACS is scheduled to review our program in 2003-2004 and in 2008-2009, so this process would start in fall 2006, two years before the 2008 ACS review.

#### **Part V. Course Proposals**

No new courses are proposed.

#### **Part VI. Letters of Support**

Letters of support from the following are attached.

- N. Bharathan & J. Southard, Biochemistry Co-coordinators
- Carl Luciano, Biology Department Chairperson

#### **Appendices**

- Suggested sequence for Chemistry B.S. with Pre-Medical Minor
- Suggested sequence for Chemistry B.A. with Pre-Medical Minor
- Revised entry in IUP undergraduate catalog

## Program Revision – Chemistry Pre-Medical Minor

Appendix A – Suggested sequence for the B.S. in Chemistry – Concentration: Pre-Medicine (120 Total Credits)

1 <sup>st</sup> Semester			2 <sup>nd</sup> Semester		
CHEM 113	Concepts in Chemistry I	4	CHEM 114	Concepts in Chemistry II	4
MATH 123	Calculus I for Chem, etc.	4	MATH 124	Calculus II for Chem, etc.	4
BIOL 111	Principles of Biology I	4	ENGL 101	College Writing	4
HIST 195	History & Mod. Era	3	BIOL 263	Genetics	3
		<b>15</b>			<b>15</b>
3 <sup>rd</sup> Semester			4 <sup>th</sup> Semester		
CHEM 231	Organic Chemistry I	4	CHEM 232	Organic Chemistry II	4
CHEM 321	Quantitative Analysis	4	CHEM 214	Intermediate Inorganic	2
PHYS 131	Physics I Lecture	3	PHYS 132	Physics II Lecture	3
PHYS 141	Physics I Lab	1	PHYS 142	Physics II Lab	1
FDNT 143	Nutrition & Wellness (or)	3	ENGL 121	Humanities Literature	3
HPED 143	Health & Wellness		ARHI 101	Intro to Art (or)	3
			MUHI 101	Intro to Music (or)	
			THTR 101	Intro to Theater	
		<b>15</b>			<b>16</b>
5 <sup>th</sup> Semester			6 <sup>th</sup> Semester		
CHEM 301	Intro to Chemical Research	1	CHEM 342	Physical Chemistry II	3
CHEM 341	Physical Chemistry I	4	CHEM 322	Instrumental Analysis	4
CHEM 351	Biochemistry	4	CHEM 498	Problems in Chemistry	1
BIOL 331	Animal Dev. Biology	3	BIOL 151	Human Physiology	4
	Foreign Language	3	ENGL 202	Research Writing	3
		<b>15</b>			<b>15</b>
7 <sup>th</sup> Semester			8 <sup>th</sup> Semester		
CHEM 343	Physical Chem I Lab	1	CHEM xxx	Chemistry Elective*	3
CHEM 410	Adv. Inorganic Chem Lab	1	CHEM 344	Physical Chem II Lab	1
CHEM 411	Adv. Inorganic Chem	3	LBST 499	Synthesis	3
CHEM 498	Problems in Chemistry	1		Social Science	3
MATH xxx	Math Elective	3		Philos./Relig. Studies	3
	Non-Western Culture	3		Free Elective	1
	Social Science	3			
		<b>15</b>			<b>14</b>

\* May be taken any semester after CHEM 341 is completed.

## Program Revision – Chemistry Pre-Medical Minor

Appendix B – Suggested sequence for the B.A. in Chemistry –Pre-Medical Minor (120 Total Credits)

1 <sup>st</sup> Semester			2 <sup>nd</sup> Semester		
CHEM 113	Concepts in Chemistry I	4	CHEM 114	Concepts in Chemistry II	4
MATH 123	Calculus I for Chem, etc.	4	MATH 124	Calculus II for Chem, etc.	4
BIOL 111	Principles of Biology I	4	ENGL 101	College Writing	4
HIST 195	History & Mod. Era (or)	3	HIST 195	History & Mod. Era (or)	3
ARHI 101	Intro to Art (or)		ARHI 101	Intro to Art (or)	
MUHI 101	Intro to Music (or)		MUHI 101	Intro to Music (or)	
THTR 101	Intro to Theater		THTR 101	Intro to Theater	
		<b>15</b>			<b>15</b>
3 <sup>rd</sup> Semester			4 <sup>th</sup> Semester		
CHEM 231	Organic Chemistry I	4	CHEM 232	Organic Chemistry II	4
CHEM 321	Quantitative Analysis	4	PHYS 132	Physics II Lecture	3
PHYS 131	Physics I Lecture	3	PHYS 142	Physics II Lab	1
PHYS 141	Physics I Lab	1	BIOL 263	Genetics	3
ENGL 121	Humanities Literature	3	ENGL 202	Research Writing	3
			FDNT 143	Nutrition & Wellness (or)	3
			HPED 143	Health & Wellness	
		<b>15</b>			<b>17</b>
5 <sup>th</sup> Semester			6 <sup>th</sup> Semester		
CHEM 341	Physical Chemistry I	4	CHEM 214	Intermediate Inorganic	2
CHEM 351	Biochemistry	4	BIOL 151	Human Physiology	4
BIOL 331	Animal Dev. Biology	3		BIOL elective	3
	Foreign Language	3		Philos./Relig. Studies	3
				Free Elective	3
		<b>14</b>			<b>15</b>
7 <sup>th</sup> Semester			8 <sup>th</sup> Semester		
CHEM 343	Physical Chem I Lab	1	LBST 499	Synthesis	3
	Non-Western Culture	3		Social Science	3
	Social Science	3		Free Electives	8
	Free Electives	8			
		<b>15</b>			<b>14</b>

## **Program Revision – Chemistry Pre-Medical Minor**

### Appendix C

#### Catalog Description – Department of Chemistry

Ruiess V.F. Ramsey, Chairperson; Asting, Ballas, Crumm, Eddy, Elcesser, Ford, Klavetter, Ko, Kupchella, Lake, Long, See, Southard, Sowa, Varughese, Wood, Woolcock; and professors emerti Bordos, Costa, Fazio, Harding, McKelvey, Patsiga, Scroxton, Syty, Tackett, Wunz, Zambotti

Website: <http://www.iup.edu/chemistry>

Degrees offered by the Department of Chemistry are the Bachelor of Science in Chemistry, the Bachelor of Arts in Chemistry, and the Bachelor of Science in Education with Chemistry major. The first two degrees are under the College of Natural Science and Mathematics, and the third is under the College of Education and Educational Technology. The department offers formal pre-medical minor programs in both the B.S. and B.A. curricula, and preparatory programs for other professional schools can be developed for either degree. The department also offers a Chemistry minor.

The B.S. in Chemistry is a professional degree and is certified by the American Chemical Society. The student completing this major should be qualified to assume a position in industry or government as a chemist, or to pursue graduate studies leading to the M.S. or Ph.D. degree in chemistry, biochemistry, materials science, forensic science or an associated field. The B.S. degree, combined with the Chemistry Pre-Medical minor, includes all courses required for entrance into medical school, and gives the student the flexibility of choosing medical school or graduate school after graduation.

The curriculum leading to the B.A. in Chemistry is designed to allow for the workable union of other disciplines with chemistry in such a way as to retain the fundamental science and mathematics requirements needed for a career in chemistry. A careful selection of electives will qualify the student for entrance into many fields in which there is an acute need for persons with scientific training, and, at the same time, satisfy the entrance requirements of various professional and graduate schools. This degree may also be of interest to students who have completed a significant number of semester hours in another degree program, and decide they want to earn a degree in chemistry. As with the B.S. degree, a Chemistry B.A. with Pre-Medical minor includes all courses required for entrance into medical school.

The B.A. in Chemistry can incorporate a complementary program in almost any other field in the university; some disciplines which make useful combinations include biology, business administration, computer science, criminology (forensic science), English (technical writing), geoscience, government, physics and safety science. In particular, a student seeking a career in forensic science should major in chemistry.

Either degree in chemistry provides excellent preparation for entrance into a variety of professional schools, including dental, veterinary, pharmacy, chiropractic and law. The student considering going to one of these professional schools after completion of a chemistry degree

### Program Revision – Chemistry Pre-Medical Minor

should work closely with their advisor and select additional courses as required by the professional school.

The curriculum leading to the B.S. in Education with Chemistry major is designed to prepare the student to teach chemistry at the secondary school level. Upon completion of the specified coursework and the requirements of the teacher certification process, the student is eligible for Pennsylvania certification by the Pennsylvania Department of Education. The B.S. in Education with a Chemistry major degree program is also certified by the American Chemical Society.

### Bachelor of Arts – Chemistry

<b>Liberal Studies:</b> As outlined in the Liberal Studies section with the following specifications: <b>Mathematics:</b> MATH 123 <b>Natural Sciences:</b> PHYS 111-121 and 112-122 or 131-141 and 132-142 <b>Liberal Studies Elective:</b> 3cr foreign language with at least one course at the intermediate level	<b>49</b>	
<b>Major:</b> <b>Required Courses</b>	<b>30-31</b>	
CHEM 113	Concepts in Chemistry I (1)	4cr
CHEM 114	Concepts in Chemistry II (1)	4cr
CHEM 214	Intermediate Inorganic Chemistry	2cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II	4cr
CHEM 321	Quantitative Analysis	4cr
CHEM 341	Physical Chemistry I	4cr
CHEM 343	Physical Chemistry I Lab	1cr
<b>Controlled Electives (2)</b>		
At least 3cr from the following: CHEM 301, 322, 342, 351, 410, 411, 498, BIOC 301, 302, 311		3-4cr
<b>Other Requirements</b>		<b>19-22</b>
Planned program (with advisor approval) in complementary field with at least 6cr of 300/400 level courses (3)		15cr
Foreign Language Intermediate Level (4)		0-3
MATH 124	Calculus II for Physics, Chemistry and Math	4cr
<b>Free Electives</b>		<b>18-22</b>
<b>Total Degree Requirements</b>		<b>120</b>

- (1) CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the chemistry B.A. degree.
- (2) Students electing the Pre-Medical minor must take CHEM 351 (4cr) or BIOC 301 and 302 (6cr).
- (3) Students electing the Pre-Medical minor must take BIOL 111, 151, 263, 331, and a 300-level BIOL elective.
- (4) Intermediate-level foreign language may be included as Liberal Studies elective.

**Program Revision – Chemistry Pre-Medical Minor  
Bachelor of Science – Chemistry**

**Liberal Studies:** As outlined in the Liberal Studies section with the following specifications: **49**

**Mathematics:** MATH 123

**Natural Sciences:** PHYS 131-141 and 132-142

**Liberal Studies Elective:** 3cr foreign language with at least one course at the intermediate level

**Major:** **45**

**Required Courses**

CHEM 113	Concepts in Chemistry I (1)	4cr
CHEM 114	Concepts in Chemistry II (1)	4cr
CHEM 214	Intermediate Inorganic Chemistry	2cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II	4cr
CHEM 301	Introduction to Research	1cr
CHEM 321	Quantitative Analysis	4cr
CHEM 322	Instrumental Analysis	4cr
CHEM 341	Physical Chemistry I	4cr
CHEM 342	Physical Chemistry II	3cr
CHEM 343	Physical Chemistry I Lab	1cr
CHEM 344	Physical Chemistry II Lab	1cr
CHEM 410	Advanced Inorganic Chemistry Lab	1cr
CHEM 411	Advanced Inorganic Chemistry	3cr
CHEM 498	Problems in Chemistry	2cr

**Controlled Electives (2)**

Additional Chemistry electives from the list: 3cr

CHEM 331, 421, 435, 441, 481

**Other Requirements** **14-18**

BIOL 111	Principles of Biology I	4cr
BIOC 301	Biochemistry I (3)	3cr
MATH 124	Calculus II for Physics, Chemistry and Math	4cr
One additional Mathematics elective from the list:		3-4cr
MATH 171, 241, 342		
Foreign Language Intermediate Level (4)		0-3

**Free Electives** **8-12**

**Total Degree Requirements** **120**

1. CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the chemistry B.S. degree.
2. Qualifying students can also use 600 level CHEM courses to meet this requirement.
3. Students completing the Chemistry Pre-Medical minor may substitute CHEM 351 for BIOC 301.
4. Intermediate-level foreign language may be included as Liberal Studies elective.



## Program Revision – Chemistry Pre-Medical Minor

### Minor (1) – Chemistry Pre-Medical

Required Courses:		18-20
BIOL 111	Principles of Biology I	4cr
BIOL 151	Human Physiology	4cr
BIOL 263	Genetics	3cr
BIOL 331	Animal Developmental Biology	3cr
Choice of either CHEM 351 (4cr) or BIOG 301 and 302 (6cr)		4-6cr

1. Open only to Chemistry majors.

(No changes were made to the Bachelor of Science in Education – Chemistry or to the Minor – Chemistry)

**Ola Kaniasty**

---

**From:** "Wendy L. Elcesser" <endyw@iup.edu>  
**To:** "Ola Kaniasty" <AKANIAST@iup.edu>  
**Sent:** Monday, September 20, 2004 10:29 AM  
**Attach:** Revised Pre-Medical Minor for Chemistry majors.doc  
**Subject:** Fw: Pre-Medical Minor for Chemistry Majors

----- Original Message -----

**From:** Wendy L. Elcesser  
**To:** Jon Southard ; Luciano, Carl S ; bharathn@grove.iup.edu  
**Cc:** See, Ronald F.  
**Sent:** Wednesday, August 11, 2004 2:06 PM  
**Subject:** Pre-Medical Minor for Chemistry Majors

The original BS- and BA- Chemistry -- Pre-Medical Concentration proposals were rejected by the UWCC out of concerns that under-prepared students would not be able to complete the degree programs under the 120-credit mandate. We had previously asked for support of these programs and you had so graciously granted support. The courses have been re-packaged as a separate minor program. Students electing the minor accept that they might have to enroll in more than the 120-credit program if they are under-prepared (historically in mathematics). Students completing the minor would accrue the identical course requirements of the original BS- and BA- Chemistry -- Pre-Medical Concentration programs that you had previously supported.

In order for the minor program to move forward and thus provide for a pre-med designation as part of a Chemistry degree, we must ask again for an updated letter of support.

We have attached the revised Pre-Medical Minor to this e-mail message. If you require any additional information, please let us know as soon as possible.  
Thank you in advance for your input.

Sincerely,

Ronald F. See  
Contact Person for New Minor Program: Chemistry Pre-Medical Minor

Wendy Lou Elcesser  
2003-2004 Chairperson, Chemistry Curriculum Committee

## Ola Kaniasty

---

**From:** "Wendy L. Elcesser" <endyw@iup.edu>  
**To:** "Ola Kaniasty" <AKANIAST@iup.edu>  
**Sent:** Wednesday, August 18, 2004 12:35 PM  
**Subject:** Re: Update on letters of support

Ola,

Carl is waiting to talk with Art Hulse since he chairs their Curriculum Committee and Art has been out of town. He promised to get back with me in a few more days. Progress, at least.

Wendy

----- Original Message -----

**From:** Ola Kaniasty  
**To:** Wendy L. Elcesser  
**Sent:** Wednesday, August 18, 2004 12:08 PM  
**Subject:** Re: Update on letters of support

Please tell Dr. Luciano that I am anxiously awaiting that letter in order to move the proposal along.

----- Original Message -----

**From:** Wendy L. Elcesser  
**To:** Ola Kaniasty  
**Sent:** Tuesday, August 17, 2004 12:05 PM  
**Subject:** Update on letters of support

Jon Southard and Bharathan have submitted a letter of support! Now all we need to do is wait to see if Carl Luciano is willing to give one as well!

Wendy

To: Curriculum Committee  
The University Senate  
IUP

From: Dr. N. Bharathan, Dr. Jonathan N. Southard,  
Co-Coordinators  
Biochemistry Program  
IUP



Date: August 13, 2004

Subject: Program Revision – Pre-Medical Minor for Chemistry Majors

We are writing to support the program revision for a Pre-Medical Minor submitted by the Chemistry Department. In terms of impact on the Biochemistry Program, the current proposal is essentially identical to the proposal for a Pre-Medical concentration within the Chemistry B. A. program. This program was discussed and approved by the Biochemistry faculty. The currently proposed program revisions will not require any additional faculty complement in the Biochemistry Program. We fully support the program revisions described in this proposal.